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Conference Abstract

From HOMED to FORSAID: Sustaining Forest Health Research Across Horizon Projects

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Abstract

Forests play a key role in achieving the objectives of the European Green Deal due to their multifunctional role. They provide multiple ecosystem services, such as soil formation, nutrient cycling, provisioning of timber, food, and water, climate regulation, and flood control, while also being of central importance for biodiversity conservation (Brockerhoff et al. 2017). However, insect and pathogen pests increasingly threaten forests, alone or after abiotic disturbances such as drought, fire, and storms (Romagnoli et al. 2023). Among pests, invasive alien species are of great concern because they can have a strong impact on forest biodiversity and economy, and many efforts are being made to regulate them in the EU (Ghelardini et al. 2017). In addition, several native pests are expanding their range because of climate change and are called emerging pest species (Jactel et al. 2019; Simler-Williamson et al. 2019). Research is therefore essential to support early detection of emerging and invasive pests, monitor their spread, and inform phytosanitary measures that can prevent or mitigate their impacts.

In this context, the Horizon 2020 project *HOMED* (HOlistic Management of Emerging forest pests and Diseases), coordinated by Hervé Jactel from the National Research Institute for Agriculture, Food and the Environment (France), developed a holistic and

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multi-actor approach to develop tools and methods for the management of emerging native and non-native pests threatening European forests, focusing on all phases of invasion, from prevention to surveillance to eradication and control. The project also broadened the definition of “forest health”, including trees not only in forests, but also in nurseries, urban and rural areas, owing to the key epidemiological role of these components. The major outputs of the project are synthesised in a special issue of the journal NeoBiota, and include a participatory tool for reporting forest damage data (*Silvalert*), improved multi-funnel traps with generic pheromone attractants (Santoiemma et al. 2024), pioneering studies on pest detection using remote sensing (Nardi et al. 2023), and sustained stakeholder engagement through six targeted policy briefs. Importantly, HOMED underscored the need for interdisciplinary collaboration across forest entomology and pathology, economics, and social sciences, and highlighted the priority of developing innovative tools for the early detection and eradication of pests.

Building on this foundation, the Horizon Europe project FORSAID (FORest Surveillance with Artificial Intelligence and Digital technologies), coordinated by Andrea Battisti from the University of Padova (Italy), continues and expands HOMED's legacy. FORSAID focuses on designing a comprehensive and technologically advanced framework for the early detection and surveillance of EU-regulated forest pests, integrating a wide range of innovative tools, including satellite- and drone-based remote sensing, smart traps with automatic monitoring capacity, robotic devices for rapid insect identification, environmental DNA methods for early pest detection, and citizen science approaches supported by mobile applications. Stakeholder engagement is central to this process, ensuring that research outputs are aligned with end-user needs and can be effectively implemented in practice. The project aims to integrate these methods into a coherent and operational monitoring and assessment system for regulated pests, thereby supporting the development of a novel pan-European strategy for forest pest management. FORSAID also ensures continuity and knowledge transfer from HOMED. For example, data on pest distribution collected in HOMED through *Silvalert* now serves as a baseline for FORSAID remote sensing activities. Generic attractants validated globally in HOMED are being incorporated into next-generation smart traps. Lastly, stakeholder surveys from HOMED provide direct input into FORSAID's research agenda. By maintaining and extending these outputs, FORSAID exemplifies how scientific legacies can be consolidated and advanced across projects.

Together, HOMED and FORSAID demonstrate the value of sustained research, innovation, and cross-disciplinary collaboration in forest health management, and their combined contributions highlight the importance of open data, participatory science, and stakeholder-driven approaches in building robust strategies against emerging forest pests.

Keywords

pests, insects, pathogens, artificial intelligence, Earth observation, open data, knowledge transfer, research continuity

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The authors have declared that no competing interests exist.

References

- Brockerhoff EG, Barbaro L, Castagneyrol B, Forrester DI, Gardiner B, González-Olabarria JR, Jactel H, et al. (2017) Forest biodiversity, ecosystem functioning and the provision of ecosystem services. Biodiversity and Conservation 26: 3005-3035. https://doi.org/10.1007/s10531-017-1453-2

- Ghelardini L, Luchi N, Pecori F, Pepori AL, Danti R, Della Rocca G, Santini A, et al. (2017) Ecology of invasive forest pathogens. Biological Invasions 19: 3183-3200. https://doi.org/10.1007/s10530-017-1487-0
- Jactel H, Koricheva J, Castagneyrol B (2019) Responses of forest insect pests to climate change: Not so simple. Current Opinion in Insect Science 35: 103-108. https://doi.org/10.1016/j.cois.2019.07.010
- Nardi D, Jactel H, Pagot E, Samalens JC, Marini L (2023) Drought and stand susceptibility to attacks by the European spruce bark beetle: A remote sensing approach. Agricultural and Forest Entomology 25: 119-129. https://doi.org/10.1111/afe.12536
- Romagnoli F, Cadei A, Costa M, Marangon D, Pellegrini G, Nardi D, Cavalli R, et al. (2023) Windstorm impacts on European forest-related systems: An interdisciplinary perspective. Forest Ecology and Management 541 https://doi.org/10.1016/j.foreco.2023.121048
- Santoiemma G, Battisti A, Courtin C, Curletti G, Faccoli M, Feddern N, Rassati D, et al. (2024) Testing a trapping protocol for generic surveillance of wood-boring beetles in heterogeneous landscapes. NeoBiota 95: 77-95. https://doi.org/10.3897/neobiota.95.129483
- Simler-Williamson AB, Rizzo DM, Cobb RC (2019) Interacting effects of global change on forest pest and pathogen dynamics. Annual Review of Ecology, Evolution, and Systematics 50: 381-403. https://doi.org/10.1146/annurev-ecolsys-110218-024934